MITSUBISHI ELECTRIC

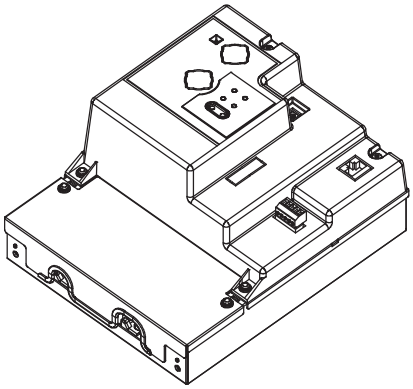
<ORIGINAL>

CE

Air Conditioning Control System
Cloud system connection device
MCC-50E

SD HC

Installation and Instructions Manual



Safety notes are marked with ⚠**WARNING** or ⚠**CAUTION**, depending on the severity of possible consequences that may result when the instructions are not followed exactly as stated.
Proper installation is important for your safety and proper functioning of the units. Thoroughly read the following safety precautions prior to installation.

Contents

Before installing the device, please read this Installation Manual carefully to ensure proper operation.
Retain this manual for future reference.

1. Safety precautions

► Thoroughly read the following safety precautions prior to installation.

► Observe these precautions carefully to ensure safety.

► After reading this manual, pass the manual on to the end user to retain for future reference.

► The user should keep this manual for future reference and refer to it as necessary. This manual should be made available to those who repair or relocate the units. Make sure that the manual is passed on to any future air conditioning system user.

► All electrical work must be performed by qualified personnel.

⚠ WARNING	: indicates a hazardous situation which, if not avoided, could result in death or serious injury.
⚠ CAUTION	: indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
CAUTION	: addresses practices not related to personal injury, such as product and/or property damage.

1-1. General precautions

⚠ WARNING

Do not install the device in areas where large amounts of oil, steam, organic solvents, or corrosive gases (such as ammonia, sulfuric compounds, or acids), or areas where acidic/ alkaline solutions or special chemical sprays are used frequently. These substances may significantly reduce the performance and corrode the internal parts, resulting in electric shock, malfunction, smoke, or fire.

To reduce the risk of injury, electric shock, or fire, do not alter or modify the device.

To reduce the risk of electric shock, malfunction, smoke, or fire, do not touch the electrical parts or 3G/4G dongle with wet fingers.

To reduce the risk of injury or electric shock, before spraying a chemical around the device, stop the operation and cover the device.

To reduce the risk of burns, do not touch the electrical parts with bare hands during and immediately after operation.

To reduce the risk of injury, keep children away while installing, inspecting, or repairing the device.

Test runs, inspection, and service must be performed by qualified personnel in accordance with this manual. Incorrect use may result in injury, electric shock, malfunction, or fire.

If you notice any abnormality, stop the operation and turn off the device. Continuing the operation may result in electric shock, malfunction, or fire.

Properly install all required covers to keep moisture and dust out of the device. Dust accumulation and the presence of water may result in electric shock, smoke, or fire.

To reduce the risk of frostbite, burns, injury, or electric shock, keep the equipment out of the reach of children.

To reduce the risk of short circuits, current leakage, electric shock, malfunction, smoke, or fire, do not wash the device with water or any other liquid.

⚠ CAUTION

To reduce the risk of fire or explosion, do not place flammable materials or use flammable sprays around the device.

To reduce the risk of electric shock or malfunction, do not touch the switches or buttons with a sharp object.

To reduce the risk of injury, electric shock, or malfunction, avoid contact with the sharp edges of certain parts.

To reduce the risk of injury, wear protective gear when working on the device.

Wear protective gear when working on the device. High-voltage parts pose a risk of electric shock, and high-temperature parts pose a risk of burns.

Consult the cloud system service provider for the proper disposal of the device.

1-2. Precautions for unit installation

⚠ WARNING

Do not install the device where there is a risk of flammable gas leaks. If flammable gas accumulates around the device, it may ignite and cause a fire or explosion.

Properly dispose of the packing materials. Plastic bags pose a suffocation hazard to children.

Take appropriate safety measures against earthquakes to prevent the device from causing injury.

To prevent injury, install the device on a flat surface strong enough to support its weight.

Use the supplied or specified parts for installation.

⚠ CAUTION

To reduce the risk of short circuits, current leakage, electric shock, malfunction, smoke, or fire, do not install the device in a place exposed to water or in a condensing environment.

The device must be installed by qualified personnel according to the instructions detailed in this manual. Improper installation may result in electric shock or fire.

1-3. Precautions for electrical wiring

⚠ WARNING

To reduce the risk of malfunction, smoke, fire, or damage to the device, do not connect the power cable to the signal terminal block.

To reduce the risk of malfunction, smoke, fire, or damage to the device, do not apply a power supply voltage in excess of that specified.

Properly secure the cables in place and provide adequate slack in the cables so as not to stress the terminals. Improperly connected cables may break, overheat, and cause smoke or fire.

To reduce the risk of injury or electric shock, switch off the main power before performing electrical work.

Electrical work must be performed by qualified personnel in accordance with local regulations and the instructions provided in this manual. Only use specified cables and dedicated circuits. Inadequate power source capacity or improper electrical work will result in electric shock, malfunction, or fire.

To reduce the risk of electric shock, install an overcurrent breaker and an earth leakage breaker on the power supply. To reduce the risk of electric shock, smoke, or fire, install an overcurrent breaker for each device.

Only use properly rated breakers (earth leakage breaker, local switch <switch + fuse that meets local electrical codes>, moulded case circuit breaker, or overcurrent breaker). The use of improperly rated breakers or the substitution of fuses with steel or copper wire may result in electric shock, malfunction, smoke, or fire.

To reduce the risk of current leakage, overheating, smoke, or fire, use properly rated cables with adequate current carrying capacity.

Proper grounding must be provided by qualified personnel. Do not connect the protective ground wire to a gas pipe, water pipe, lightning rod, or telephone wire. Improper grounding may result in electric shock, smoke, fire, or malfunction due to electrical noise interference.

⚠ CAUTION

To reduce the risk of short circuits, electric shock, or malfunction, keep wire pieces and sheath shavings out of the terminal block.

To reduce the risk of short circuits, current leakage, electric shock, or malfunction, keep the cables out of contact with device edges.

To reduce the risk of electric shock, malfunction, or fire, seal the gap between the cable and the end of the conduit tube with putty.

To reduce the risk of injury, do not touch the burrs of the knockout holes.

1-4. Precautions for relocating or repairing the unit

⚠ WARNING

The device must be repaired or moved only by qualified personnel. Do not disassemble or modify the device. Improper installation or repair may result in injury, electric shock, or fire.

⚠ CAUTION

To reduce the risk of short circuits, electric shock, malfunction, or fire, do not touch the circuit board with tools or with your hands, and do not allow dust to accumulate on the circuit board.

1-5. Additional precautions

CAUTION

To avoid damage to the device, use appropriate tools to install, inspect, or repair the device.

Appropriately set the broadband router, firewall, or other network settings so that the MCC-50 is not accessed from an external network.

Take appropriate measures against electrical noise interference when installing the device in hospitals or radio communication facilities. Inverter, high-frequency medical, or wireless communication equipment as well as power generators may cause the air conditioning system to malfunction. The air conditioning system may also adversely affect the operation of these types of equipment by creating electrical noise.

To avoid malfunction, do not bundle power cables and signal cables together or place them in the same metallic conduit.

To avoid damage to the device, do not overtighten the screws.

To avoid deformation and malfunction, do not install the device in direct sunlight or where the ambient temperature may exceed 55°C (131°F) or drop below -10°C (14°F).

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.

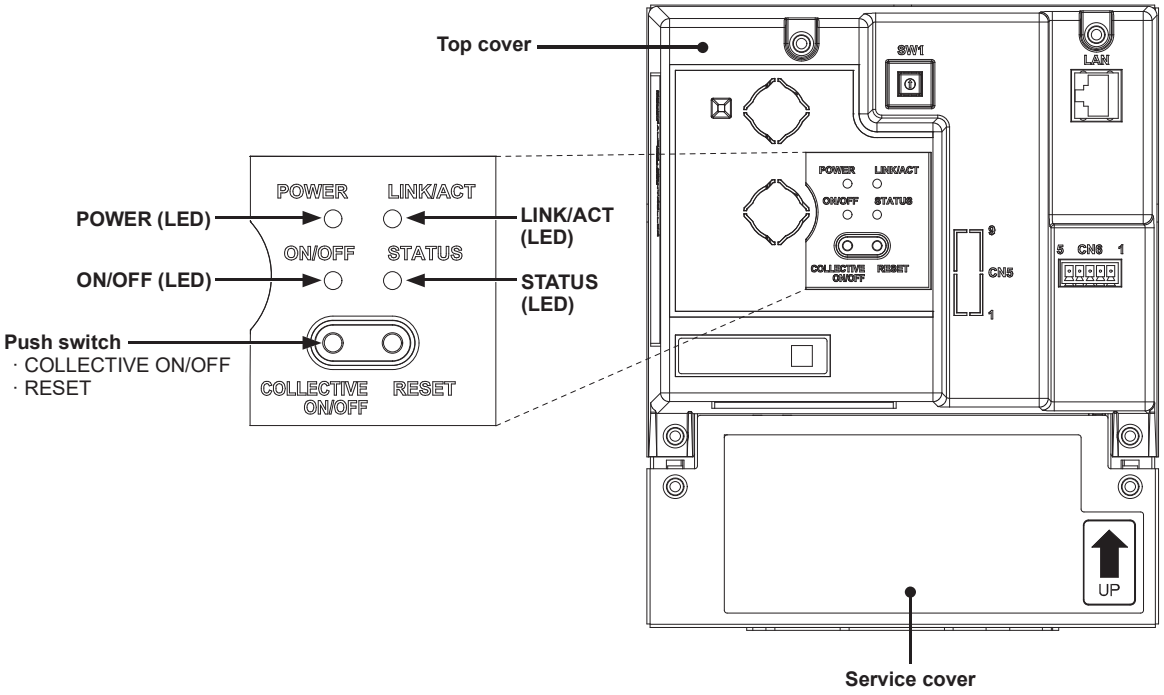
2. Introduction

The MCC-50E controls the air conditioning systems from the special cloud system on the Internet. The MCC-50E accesses the special cloud system via a wired network or a mobile phone network (3G/4G). To use the MCC-50E, a terminal device such as a computer, tablet, or smartphone with connection to the Internet is required. Hereafter, MCC-50E, unless otherwise specified, will be called “MCC-50.”

Note: Contact the cloud system service provider for how to use the cloud system.

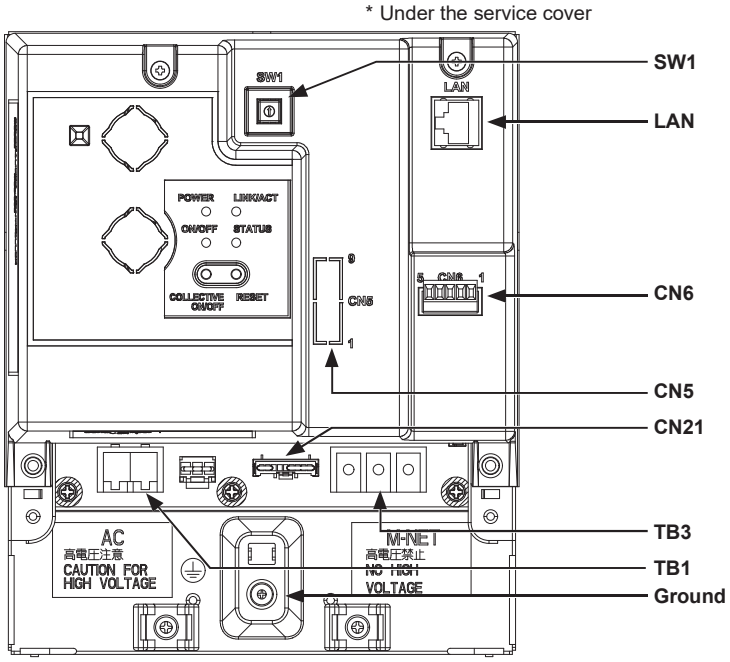
Note: This device is not suitable for use in locations where children are likely to be present.

2-1. Part names



Item			Description
LED	POWER	Lit in green	Power ON
		Unlit	Power OFF
	ON/OFF	Lit in green	One or more air conditioning units are ON. *1
		Blink in green	One or more air conditioners, air-cooled chilling unit and other related devices are in error.
		Unlit	All air conditioning units are OFF. *1
	STATUS	Brink in white	Connecting to the cloud system
		Lit in green	Being connected to the cloud system
		Brink in green	Being connected to the cloud system (weak signal)
		Unlit	Being not connected to the cloud system
		Blink in orange	Startup error
		Blink in blue	Software update in progress
		Blink in pink	Software update failed
LINK/ACT		Blink in orange	Communicating with a device connected via a LAN cable.
Push switch	COLLECTIVE ON/OFF		Used to turn the connected air conditioning units ON and OFF all at once.
	RESET		Used to reboot the MCC-50. (This will not affect the operation status of the air conditioning units.)

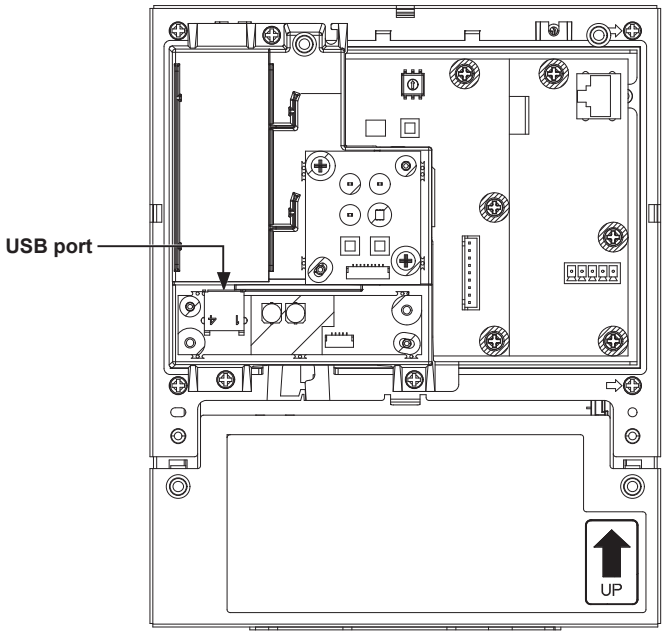
*1 The operation status of the other equipment are excluded.



Item	Description
SW1	Sets the network settings. Refer to section 7-2 “Network settings”.
LAN	Connects to the cloud system via LAN.
CN6 *1	Connects to the watt-hour meter.
CN5 (External I/O) *1	Connects to an external input/output adapter PAC-YG10HA-E. (When connecting an external input/output adapter PAC-YG10HA-E, cut out the knockout hole.)
CN21 (M-NET power jumper)	Connects to the M-NET power jumper to supply power (default). * If another system controller is connected to the same M-NET system and the power consumption coefficient is 1.5 or above, disconnect the M-NET power jumper to supply power from the separately-sold power supply unit.
TB3 (M-NET A, B, S) (M3.5)	M-NET transmission terminal block Connects to M-NET transmission cables from the outdoor unit. (A, B: Non-polarized, S: Shield)
TB1 (Power source AC L/L1, N/L2) (M3.5)	Connects to the power cable.
Ground (M4)	Connects to the protective ground wire.

*1 Refer to chapter 9 “Connection to external devices” for details.

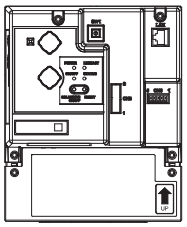
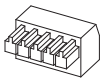
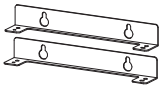
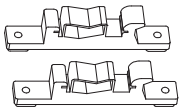
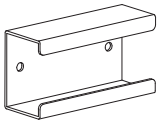
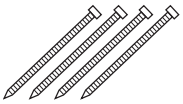
* Under the top cover



Item	Description
USB port	To access the cloud system via a mobile phone network, insert a 3G/4G dongle specified by the cloud system service provider. Refer to section 6-4 “Connecting to the cloud system via a mobile phone network” for details.

3. Package contents

The following items are included in the package.

	Package contents		Qty.
(1)	MCC-50		1
(2)	Connector (CN6)		1
(3)	L-fitting		2
(4)	DIN rail attachment (for attaching DIN rail of 35 mm (1-7/16 in) width)		2
(5)	DIN rail auxiliary bracket		1
(6)	Roundhead screw (M3 × 12) *1 (for fixing DIN rail attachment)		4
(7)	Roundhead screw (M3 × 6) *1 (for fixing DIN rail auxiliary bracket or L-fitting)		4
(8)	Cable tie		4 (Two are spare.)
(9)	Grommet		2
(10)	Installation and Instructions Manual (this manual)		1

*1 ISO metric screw thread

4. Specifications

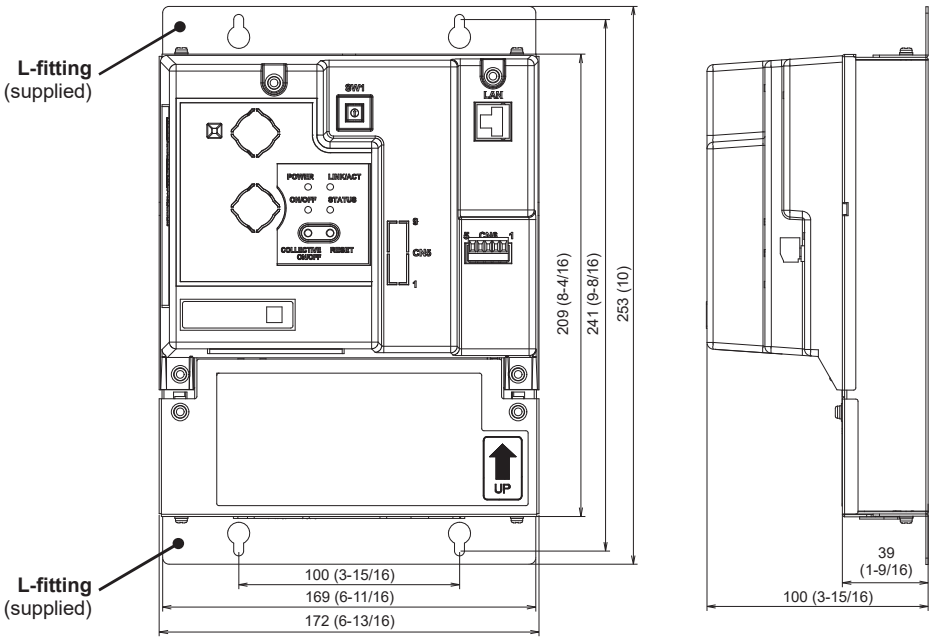
4-1. Product specifications

Item			Specifications
Power supply			100–240 VAC ± 10%; 50/60 Hz Single-phase
M-NET power feeding coefficient			1.5
Network interface			100BASE-TX
Ambient conditions	Temperature	Operating temperature range	-10°C – +55°C (+14°F – +131°F)
		Storage temperature range	-20°C – +60°C (-4°F – +140°F)
	Humidity		30%–90% RH (Non-condensing)
Dimensions (W × H × D)			172 × 209 × 100 mm (6-13/16 × 8-4/16 × 3-15/16 in) * 172 × 253 × 92 mm (6-13/16 × 10 × 3-10/16 in) when using L-fittings
Weight			1.7 kg (3-3/4 lbs)
Installation conditions			Only inside the metal control box

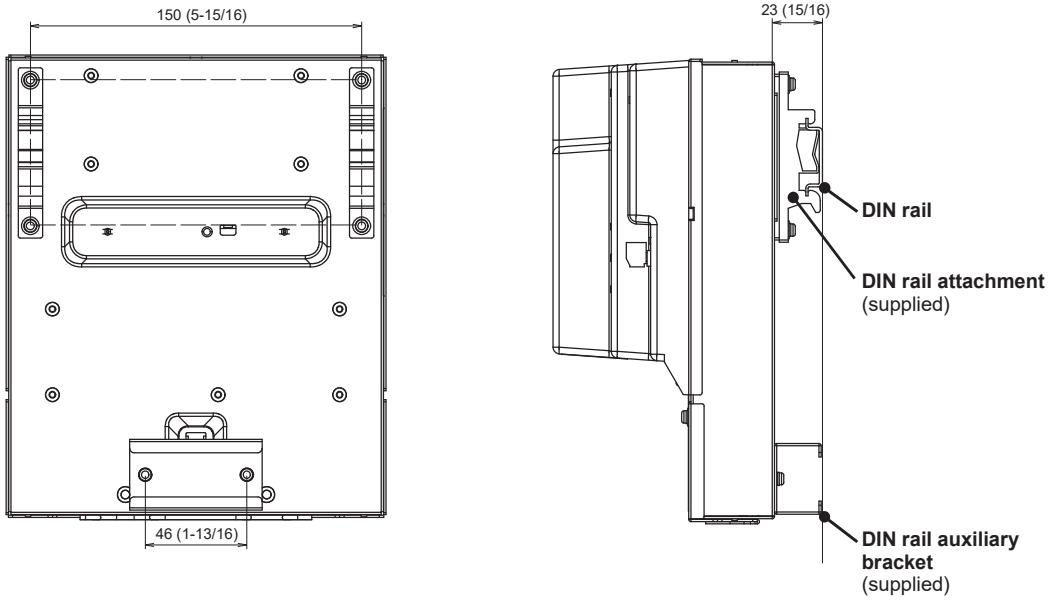
4-2. External dimensions

(1) When using L-fittings

Unit: mm (in)



(2) When using DIN rail



5. Installation

⚠ WARNING

Test runs, inspection, and service must be performed by qualified personnel in accordance with this manual. Incorrect use may result in injury, electric shock, malfunction, or fire.

Do not install the device where there is a risk of flammable gas leaks. If flammable gas accumulates around the device, it may ignite and cause a fire or explosion.

Take appropriate safety measures against earthquakes to prevent the device from causing injury.

To prevent injury, install the device on a flat surface strong enough to support its weight.

⚠ CAUTION

To reduce the risk of short circuits, current leakage, electric shock, malfunction, smoke, or fire, do not install the device in a place exposed to water or in a condensing environment.

5-1. Items not included

The following items are required to install the MCC-50.

Items not included		Specifications
Locknuts and bushing		Must be suitable for the conduit tube to be used.
Sleeved ring terminal		M3.5 ring terminal (for AC power cables (L/L1, N/L2) and M-NET transmission cables (A, B, S)) M4 ring terminal (for protective ground wire)
AC power cable/Protective ground wire		Type: Sheathed cable (should not be lighter than ordinary sheathed cable IEC 60227.) (designation 60227 IEC 53) Recommended type: VCT, VVF, VVR, or its equivalent Size: 0.75 to 2 mm² (ø1.0 to ø1.6 mm), AWG 18 to 14 Protective ground wire color: green/yellow * Use a wire with an appropriate diameter so that the wire can be fixed with the cable tie below the terminal block. A diameter of 10 mm (25/64 in) is recommended.
Transmission cable		Type: Shielded cable ● CPEVS ø1.2 mm ● CVVS 1.25 to 2 mm² * CPEVS: PE*1 insulated PVC*1 jacketed shielded communication cable * CVVS: PVC*1 insulated PVC*1 jacketed shielded control cable
Relay (for external input)		Contact rating Rated voltage: 12 or 24 VDC Rated current: 10 mA or above Minimum applied load: DC 1 mA
Relay (for external output)		Operation coil Rated voltage: 12 or 24 VDC Power consumption: Max. 0.9 W
LAN cable (when connecting to the cloud system using a wired network)		Category 5 or above straight cable (Max. 100 m (328 ft))
3G/4G dongle (when connecting to the cloud system using a mobile phone network)		For compatible models, contact the cloud system service provider.
External antenna (as necessary)		For compatible parts, contact the cloud system service provider.
Relay cable for external antenna (as necessary)		For compatible parts, contact the cloud system service provider.
Watt-hour meter (as necessary)		For compatible models, contact the cloud system service provider.
Cable for watt-hour meter (as necessary)		Type: Twisted pair cable (Max. 1200 m (3937 ft)) ● Twisted wire: 0.75 to 1.25 mm², AWG 18 to 16
Switching HUB (as necessary)		A communication speed of 100 Mbps or faster is recommended.
Broadband router (as necessary)		—
Overcurrent breaker (fuse or circuit breaker)	Fuse	Rated current: 3 A * When using a fuse, use it in combination with a switch (rated current: 3 A).
	Circuit breaker *2	Type: Bipolar (2P2E) Rated current: 3 A
Earth leakage breaker *2		Type: Bipolar (2P2E) Rated current: 3 A or above Rated current sensitivity: 30 mA Operation time: Max. 0.1 sec
A terminal device with connection to the Internet		PC, smartphone, tablet, etc.

*1 PE: Polyethylene, PVC: Polyvinyl chloride

*2 Use a breaker with a contact distance of 3 mm (1/8 in) or more.

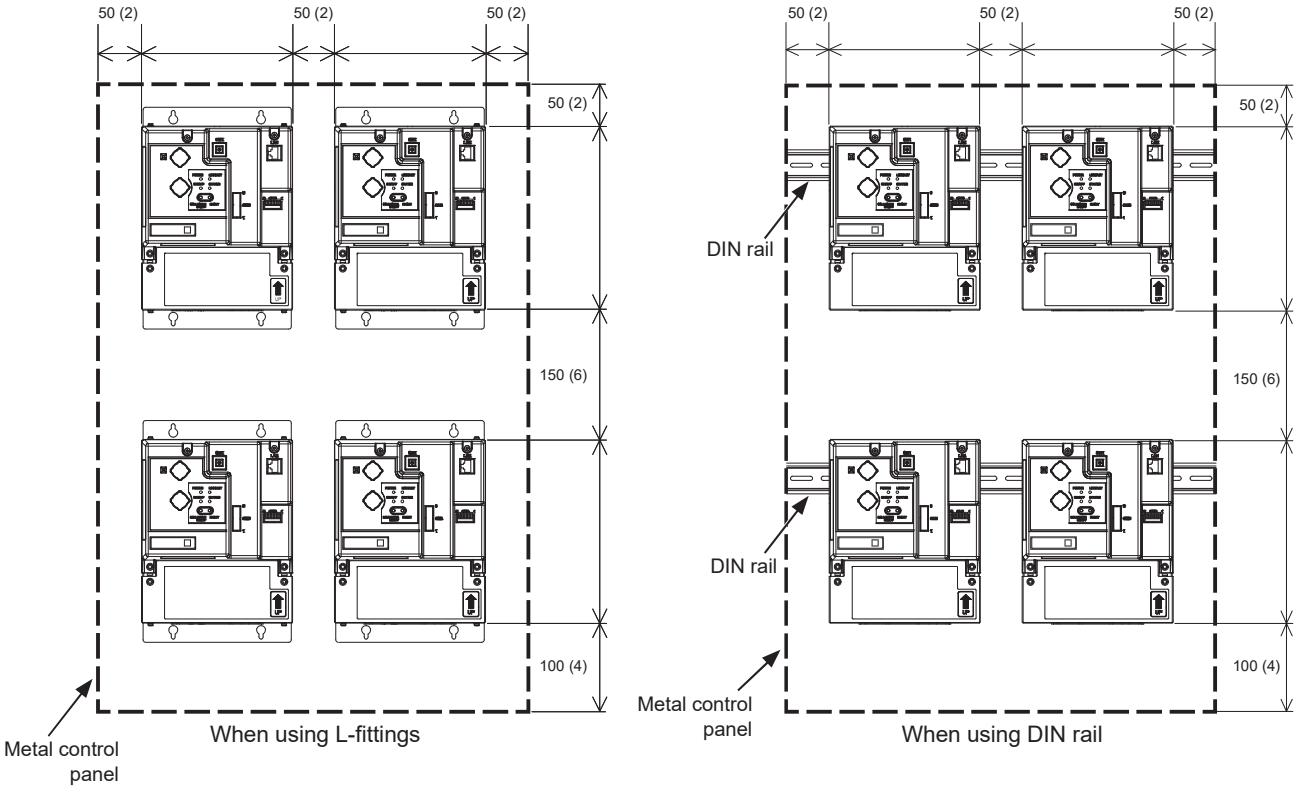
5-2. Items sold separately

Items sold separately	Model name	Remarks
External input/output adapter	PAC-YG10HA-E	Required when using the external input/output function

5-3. Installation space

The MCC-50 must be installed inside the metal control box.
Either the supplied L-fittings or DIN rail attachments can be used for the installation.
Leave a space around the MCC-50 as shown in the figure below.

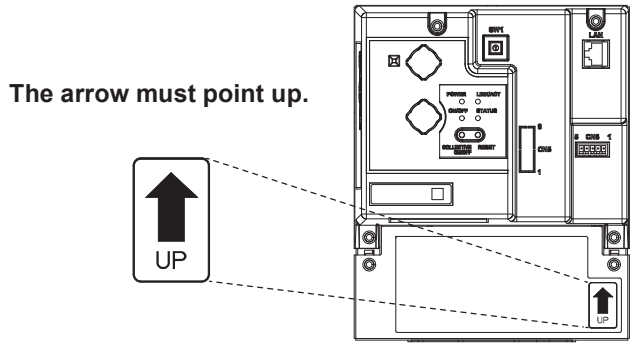
Unit: mm (in)



5-4. Installation procedures

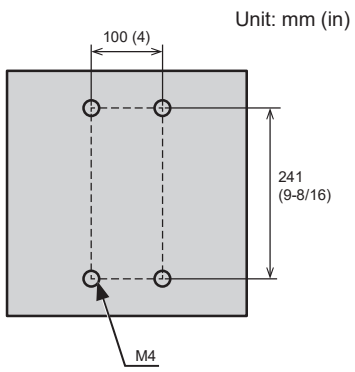
Note

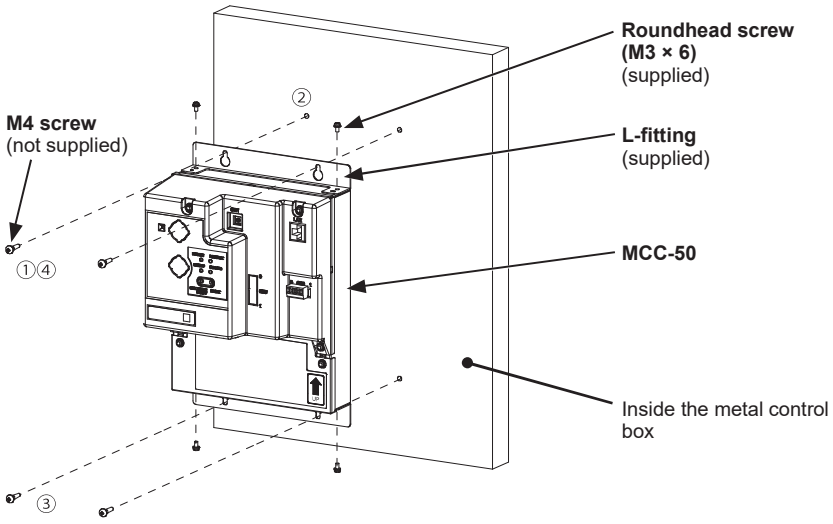
- The MCC-50 should be installed at a height up to 2 m.
- Connect the necessary cables and wires before installing MCC-50, referring to chapters 6 and 9.
- Do not install the unit where the unit may continuously receive vibration. The continuous vibration may cause the connectors to disconnect.
- Before dismounting the MCC-50 from the metal control panel or from the DIN rail, disconnect the power cable and M-NET transmission cables.
- Install the MCC-50 so that the arrow on the label points up.



5-4-1. Method 1: Installation using L-fittings

1. Have a metal control box ready.
2. Cut screw holes on the surface on which the MCC-50 will be installed as shown in the figure below, taking into consideration the installation space.
3. Attach the supplied two L-fittings to the MCC-50 with the supplied roundhead screws (M3 × 6). Tighten the screw to a torque of 0.5 N·m.
4. Properly install the MCC-50 with the M4 screws (not supplied) inside the metal control box as shown in the figure below.
   ① Temporarily tighten the top M4 screws.
   ② Temporarily place the M4 screws through the screw holes at the top of the L-fitting.
   ③ Tighten the bottom M4 screws. Tighten the screw to a torque of 0.5 N·m.
   ④ Tighten the top M4 screws. Tighten the screw to a torque of 0.5 N·m.



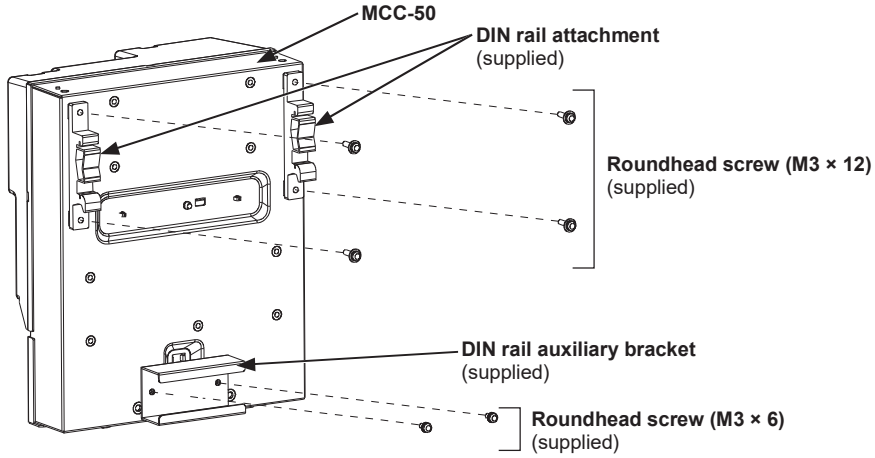


Note

- The MCC-50 to which the L-fittings are attached must be fixed to the metal control box with total of four M4 screws to prevent it from falling.
- The surface on which the MCC-50 will be installed needs to be strong enough to support its weight (1.7 kg (3-3/4 lbs) each).

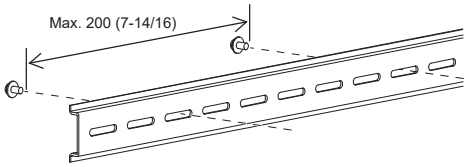
5-4-2. Method 2: Installation using DIN rail

1. Have a metal control box ready.
2. Attach the supplied two DIN rail attachments to the MCC-50 with the supplied roundhead screws (M3 × 12). Tighten the screw to a torque of 0.5 N·m.
3. Attach the supplied DIN rail auxiliary bracket to the MCC-50 with the supplied roundhead screws (M3 × 6). Tighten the screw to a torque of 0.5 N·m.



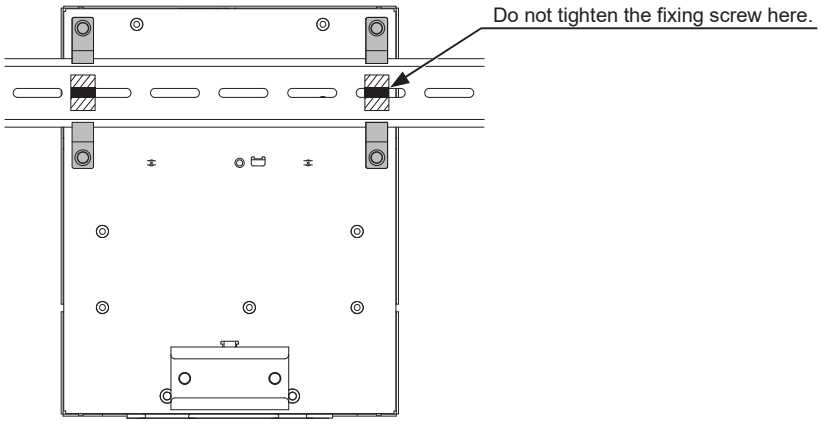
4. Mount the DIN rail (not supplied) to the metal control box.
   * Use a DIN rail of 35 mm (1-7/16 in) width.

Unit: mm (in)

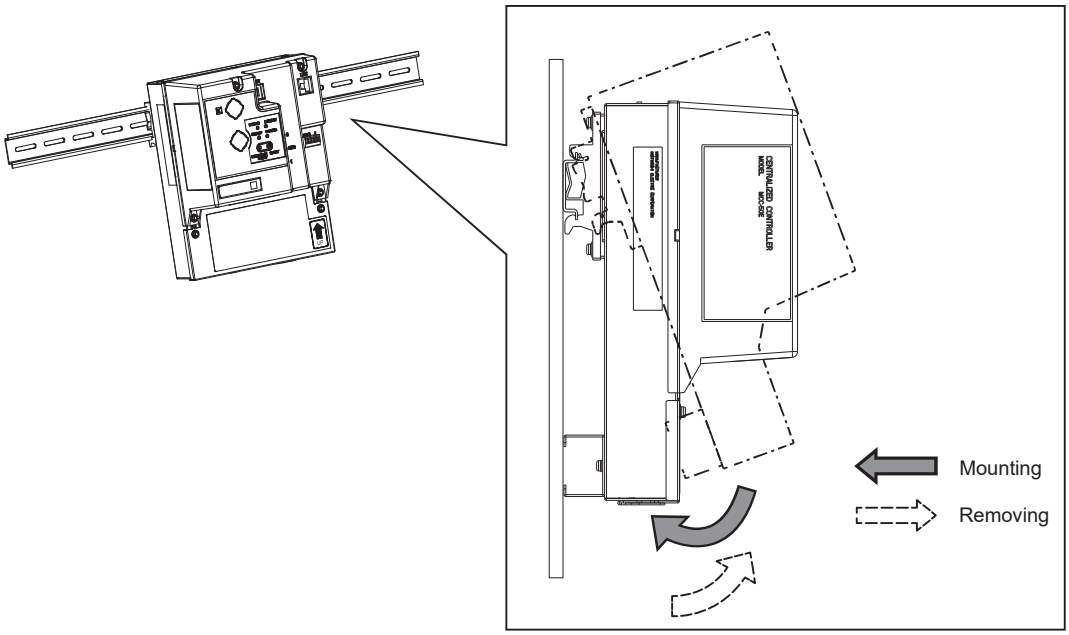


Note

- To secure the strength, the screw pitch must be 200 mm (7-7/8 in) or less when DIN rail is mounted to the metal control box.
- The surface on which the MCC-50 will be installed needs to be strong enough to support its weight (1.7 kg (3-3/4 lbs) each).
- Do not install the MCC-50 where it may receive vibration.
- To avoid the contact of the DIN rail fixing screws with the DIN rail attachment, do not tighten the fixing screws at the shaded areas in the figure below.



[Mounting/removing the MCC-50 on/from the DIN rail]



(1) Mounting

1. Hook the upper side of the attachments to the DIN rail.
2. Push the lower part of the MCC-50 until it snaps into place.

Note

- Ensure that the DIN rail attachments are fixed securely in place to the DIN rail.

(2) Removing

1. Pull the lower part of the MCC-50 toward you.
2. Remove the MCC-50 from the DIN rail.

6. Wiring connections

⚠ WARNING

To reduce the risk of malfunction, smoke, fire, or damage to the device, do not connect the power cable to the signal terminal block.

To reduce the risk of injury or electric shock, switch off the main power before performing electrical work.

Electrical work must be performed by qualified personnel in accordance with local regulations and the instructions provided in this manual. Only use specified cables and dedicated circuits. Inadequate power source capacity or improper electrical work will result in electric shock, malfunction, or fire.

To reduce the risk of electric shock, install an overcurrent breaker and an earth leakage breaker on the power supply. To reduce the risk of electric shock, smoke, or fire, install an overcurrent breaker for each device.

Proper grounding must be provided by qualified personnel. Do not connect the protective ground wire to a gas pipe, water pipe, lightning rod, or telephone wire. Improper grounding may result in electric shock, smoke, fire, or malfunction due to electrical noise interference.

⚠ CAUTION

To reduce the risk of injury, do not touch the burrs of the knockout holes.

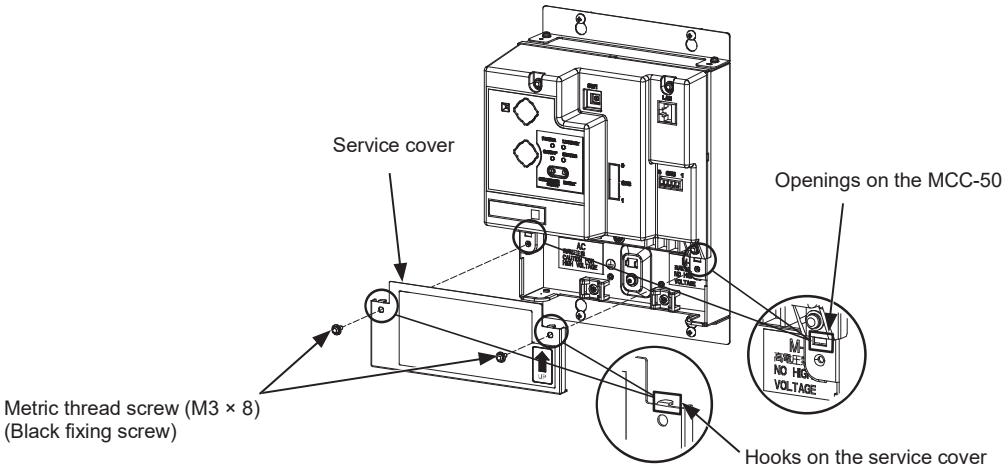
CAUTION

To avoid malfunction, do not bundle power cables and signal cables together or place them in the same metallic conduit.

6-1. Removing/reinstalling the service cover

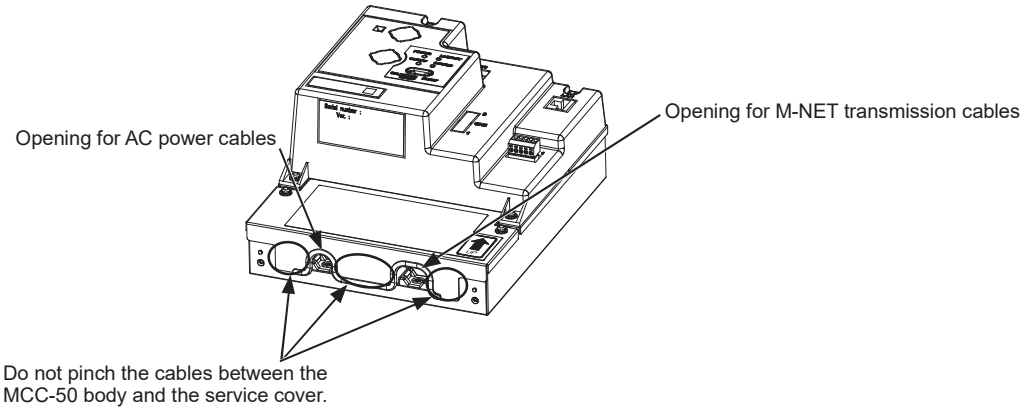
(1) Removing

1. Unscrew the two fixing screws on the service cover.
2. Remove the service cover.



(2) Reinstalling

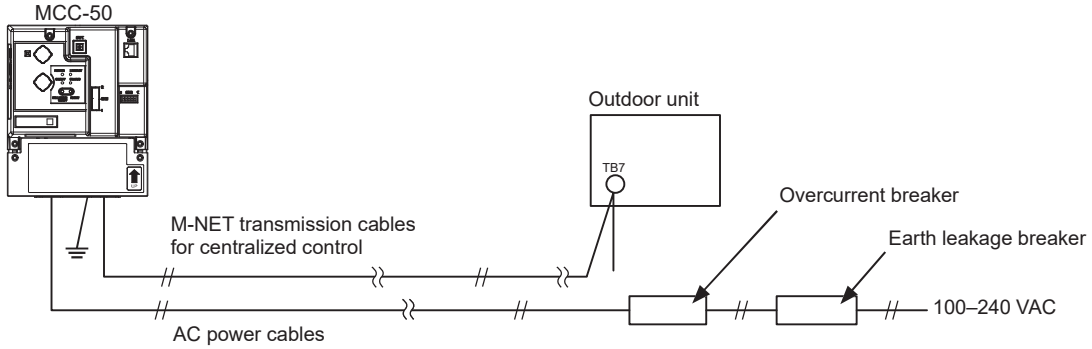
1. Insert the AC power cables and M-NET transmission cables into the openings, and then insert the hooks to the openings.
   Note: Do not pinch the cables between the MCC-50 body and the service cover.
2. Screw down the service panel with the two fixing screws. Tighten the screw to a torque of 0.5 N·m.
3. Check that there are no pinched cables between the MCC-50 body and the service cover.



6-2. Connecting AC power cables and M-NET transmission cables

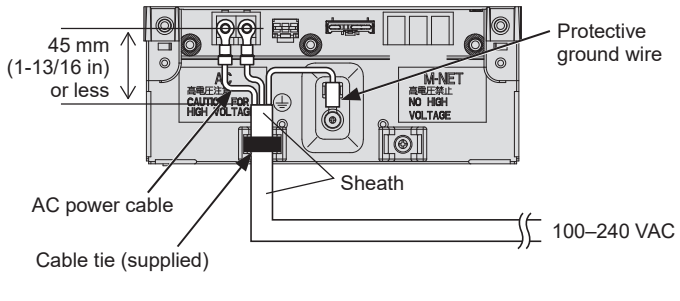
⚠ WARNING

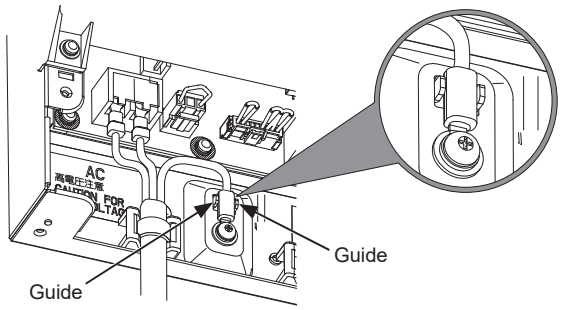
Properly secure the cables in place and provide adequate slack in the cables so as not to stress the terminals. Improperly connected cables may break, overheat, and cause smoke or fire.



6-2-1. AC power cables and protective ground wire

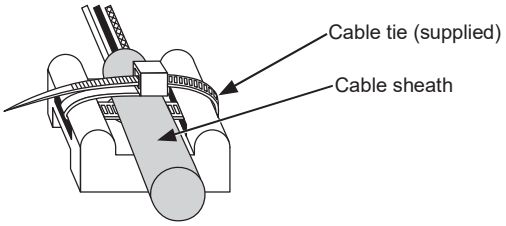
1. Attach M3.5 sleeved ring terminals to the AC power cables, and attach an M4.0 sleeved ring terminal to the protective ground wire.
2. Connect the AC power cables to the power supply terminal block, and connect the protective ground wire to the ground terminal.
   Note: Thread the protective ground wire through the guides to prevent the wire from moving when it is retightened to the ground terminal.
3. Fix the cables in place with the supplied cable tie.





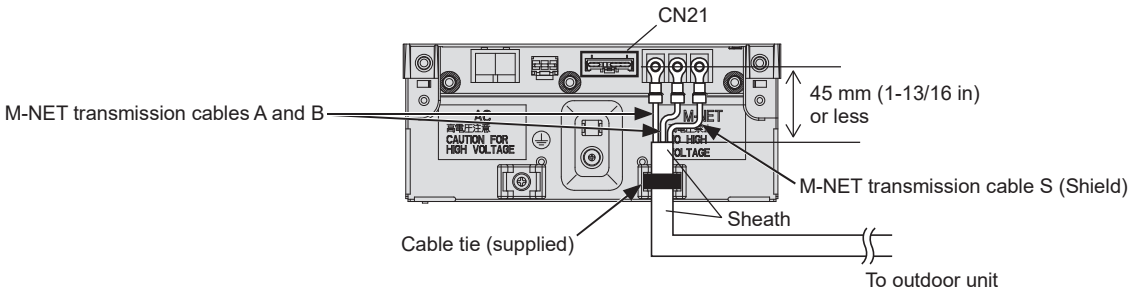
Note

- Make the protective ground wire 25 mm (1 in) longer than the AC power cables (L/L1, N/L2).
- Tighten the terminal screws to a torque of 1.0 to 1.3 N•m.
- Properly fix the cable sheaths in place with the supplied cable ties. The distance between the sheath end and the ring terminal must be 45 mm (1-13/16 in) or less.
- Fix the cables in place with the supplied cable tie.
  By pulling the cables, check that the cables do not slip out of the cable tie.



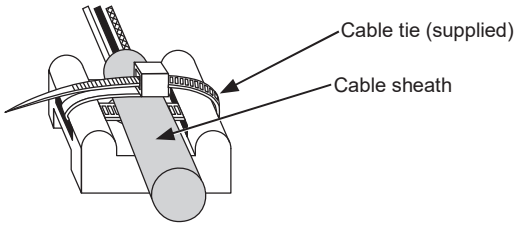
6-2-2. M-NET transmission cables (Centralized control transmission cables)

1. Attach M3.5 sleeved ring terminals to the M-NET transmission cables (A, B, Shield).
2. Connect the M-NET transmission cables to the M-NET terminal block.
3. Fix the cables in place with the supplied cable tie.
4. When the power is supplied from the unit other than the MCC-50, disconnect the M-NET power jumper from CN21.



Note

- Provide a single point ground for the shield of the centralized control transmission cable. (Provide the appropriate grounding according to local standards.)
- When leaving the M-NET power jumper connected to CN21 on the MCC-50, the M-NET S (shield) terminal of TB3 is connected to the ground terminal block on the unit, and the ground is supplied via the protective ground wire.
- When disconnecting the M-NET power jumper from CN21 on the MCC-50, provide a ground point at a power supply unit (PAC-SC51KUA).
- Tighten the terminal screws to a torque of 1.0 to 1.3 N•m.
- Properly fix the cable sheaths in place with the supplied cable ties. The distance between the sheath end and the ring terminal must be 45 mm (1-13/16 in) or less.
- Fix the cables in place with the supplied cable tie.
  By pulling the cables, check that the cables do not slip out of the cable tie.



6-3. Connecting to the cloud system via a wired network

CAUTION

Appropriately set the broadband router, firewall, or other network settings so that the MCC-50 is not accessed from an external network.

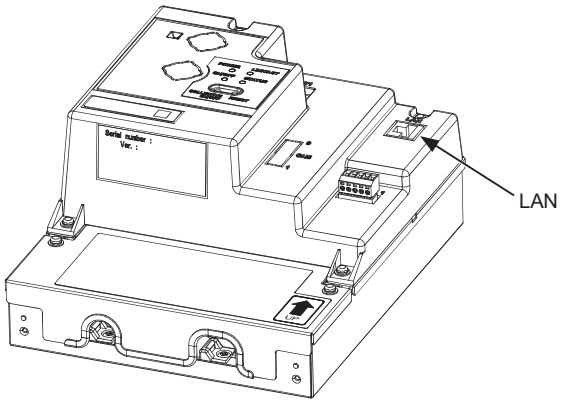
Connect the MCC-50 to a broadband router connected to the Internet.

Note

- MCC-50 cannot be connected to the cloud system via a proxy server.
- To connect the MCC-50 to the cloud system via a mobile phone network, refer to section 6-4.

6-3-1. Connecting the LAN cable

Connect the LAN cable to the LAN port on the MCC-50.
The LAN cable is not supplied. Use a category 5 or above straight LAN cable (Max. 100 m (328 ft)).

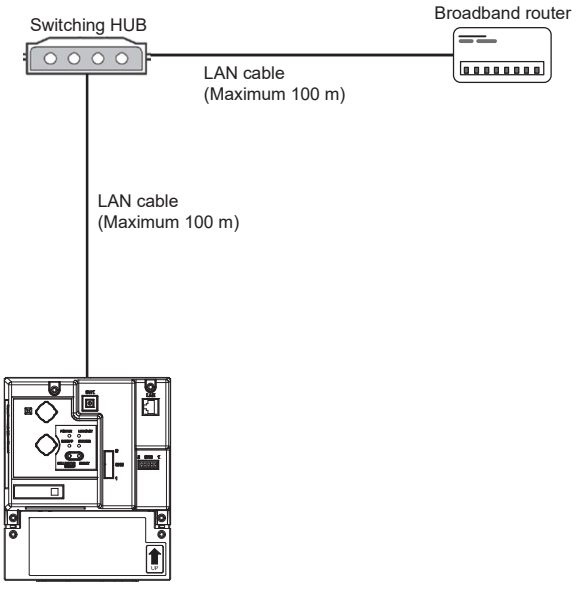


6-3-2. Connecting the MCC-50 to a broadband router with a LAN cable

Connect the MCC-50 to a broadband router with a LAN cable.

Note

- The length of the LAN cable that connects the MCC-50 directly to a broadband router must be up to 100 m [328 ft].
- Relay the LAN cable with a switching HUB, if necessary, so that the LAN cable length will not exceed 100 m [328 ft]. The maximum distance between the switching HUB and the MCC-50 must be 100 m (328 ft).
- Use a switching HUB compatible with 100BASE-TX.



When relayed through a switching HUB

6-4. Connecting to the cloud system via a mobile phone network

Install a 3G/4G dongle to the MCC-50.

To install the 3G/4G dongle to the MCC-50, the top cover needs to be removed/installed. Refer to section 6-4-1 for details.

Refer to section 6-4-2 when not attaching an external antenna to the 3G/4G dongle. Refer to section 6-4-3 when attaching an external antenna to the 3G/4G dongle.

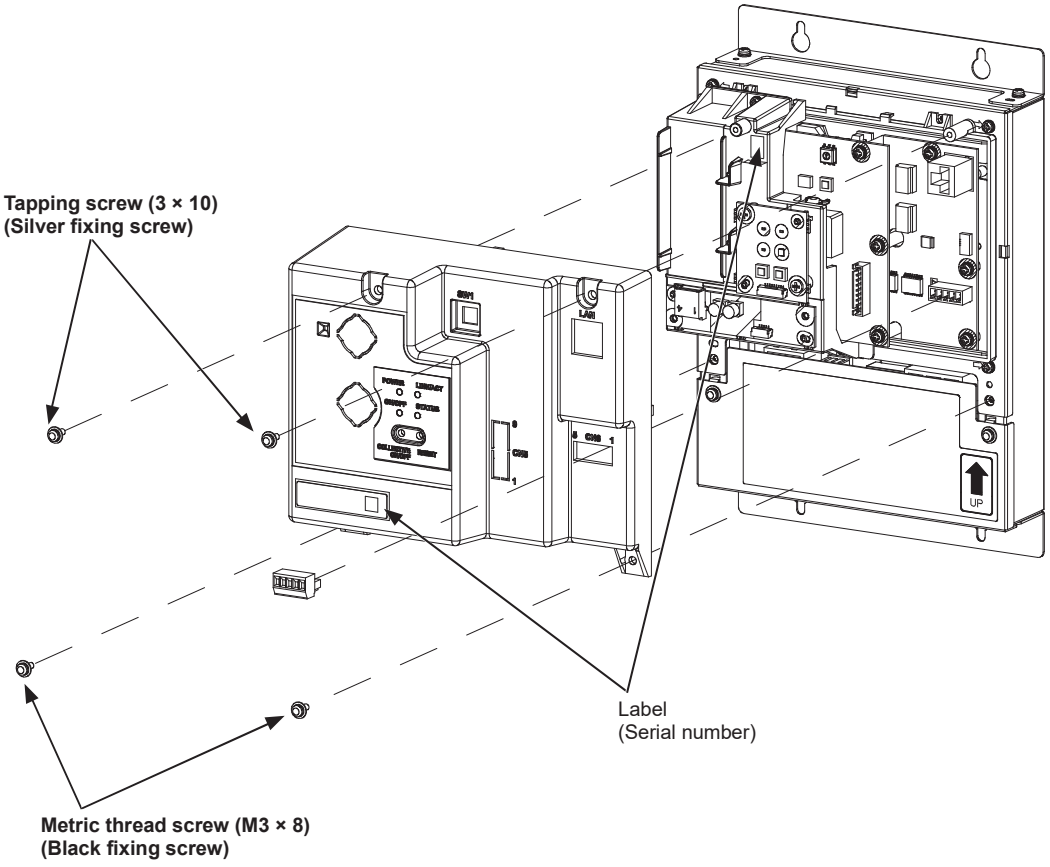
Note

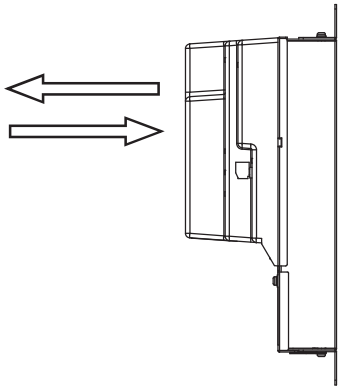
- If radio interference occurs between the 3G/4G dongle and other devices, relocate the MCC-50.
- If a radio disturbance problem occurs, contact the cloud system service provider.
- Keep a proper distance between the 3G/4G dongle and wireless transmitting devices such as cordless phones, microwave ovens, and wireless LANs to prevent radio interference from these devices from affecting the operation and performance of the MCC-50.
- Whether an external antenna is necessary or not is determined by the preliminary survey conducted by the cloud system service provider. For details, contact the cloud system service provider.
- Refer to section 6-3 for connection to the cloud system via a wired network.

6-4-1. Removing/reinstalling the top cover

(1) Removing

1. Unscrew the two tapping screws and two metric thread screws on the top cover.
2. Remove the top cover by pulling it horizontally so as not to break the circuit board inside.





(2) Reinstalling

1. Screw down the top cover with the four fixing screws. Tighten the screw to a torque of 0.5 N·m.

Note

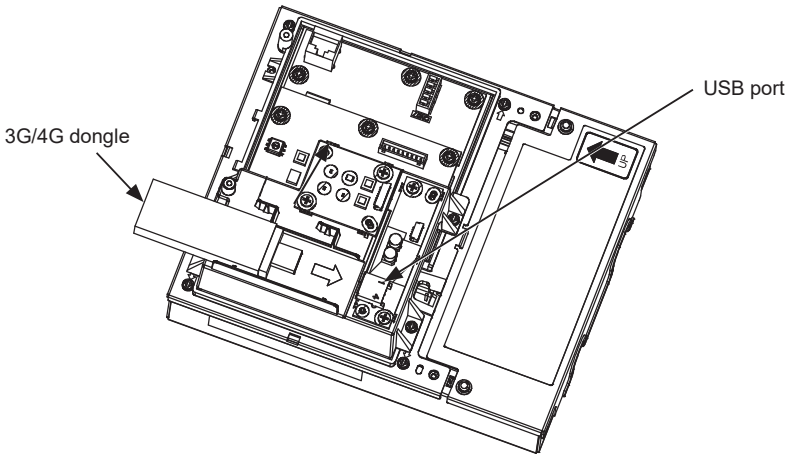
- Before installing the top cover, check that the serial number shown on the MCC-50 matches with that on the top cover. The serial number is indicated on the label shown above.
- There are two types of fixing screws. Install them in the correct positions. See the figure above for details.
- Because the top cover may fall off during installation, hold the top cover by hand when attaching the fixing screws.
- Do not use the screws for the EW-50 because the screw type is different from that of the MCC-50.

6-4-2. Connecting the 3G/4G dongle (without attaching an external antenna)

1. Remove the top cover, and connect the 3G/4G dongle to the USB port on the MCC-50.

Note

- Before connecting or disconnecting the 3G/4G dongle, turn off the power of the MCC-50.
- Insert the 3G/4G dongle to the USB port gently so as not to damage the USB port.



2. Attach the top cover.

6-4-3. Connecting the 3G/4G dongle (with an external antenna attached)

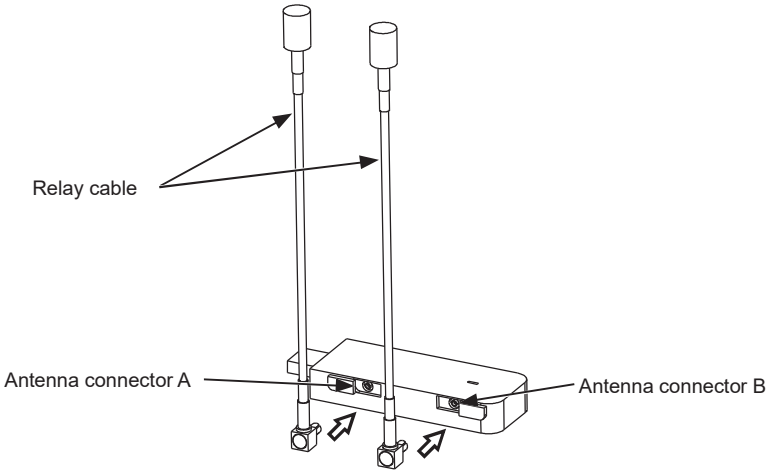
If the radio wave condition is poor at the MCC-50 installation site, use external antennas when the 3G/4G dongle has ports to connect the antennas.

Note

- The following is an example of the procedure for attaching an external antenna. For details, contact the cloud system service provider.

1. Connect a relay cable to the 3G/4G dongle.

When attaching one antenna: Connect one relay cable to the antenna connector A or B.
When attaching two antennas: Connect two relay cables to the antenna connectors A and B.

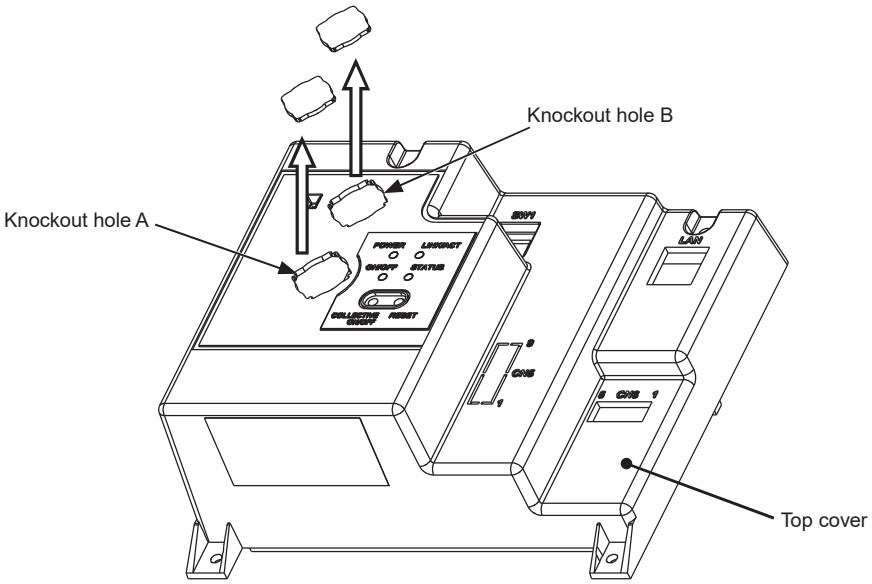


2. Punch knockout holes using a screwdriver.

When attaching one antenna: Punch a knockout hole A or B.
When attaching two antennas: Punch knockout holes A and B.

Note

- Remove burrs from the holes to prevent injuries.

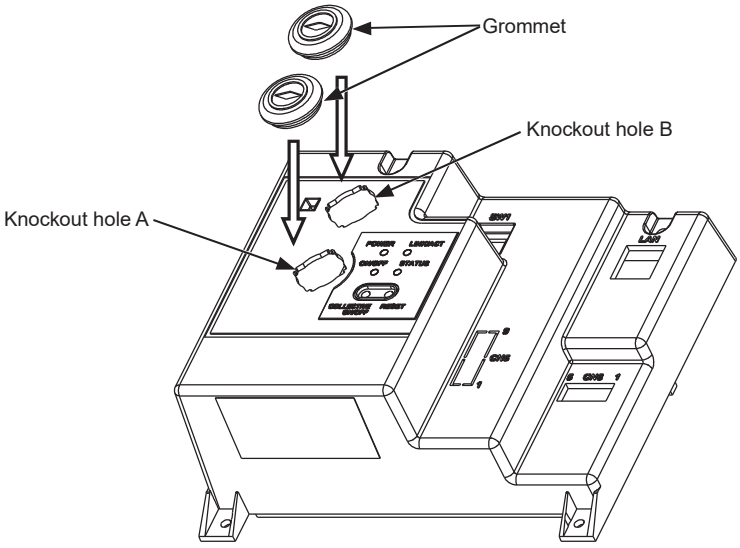


3. Cut a notch in the grommets (supplied).

When attaching one antenna: Cut a notch in one grommet.
When attaching two antennas: Cut a notch in two grommets.

4. Fit the grommets to the knockout holes.

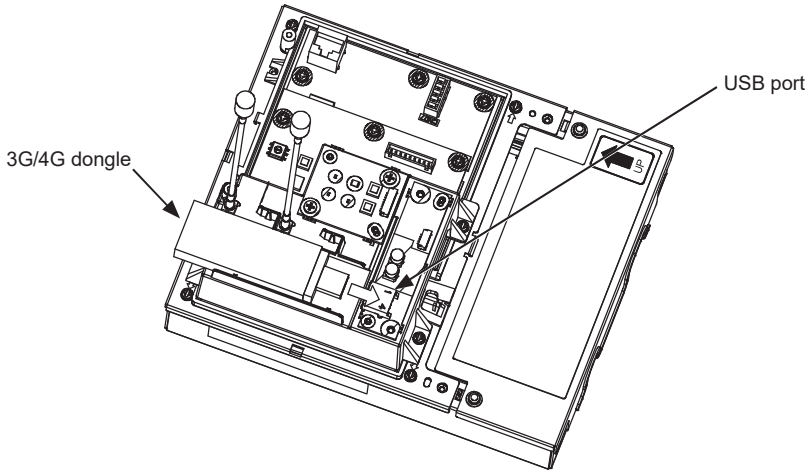
When attaching one antenna: Fit one grommet to knockout hole A or B.
When attaching two antennas: Fit two grommets to knockout holes A and B.



5. Connect the 3G/4G dongle to the USB port on the MCC-50.

Note

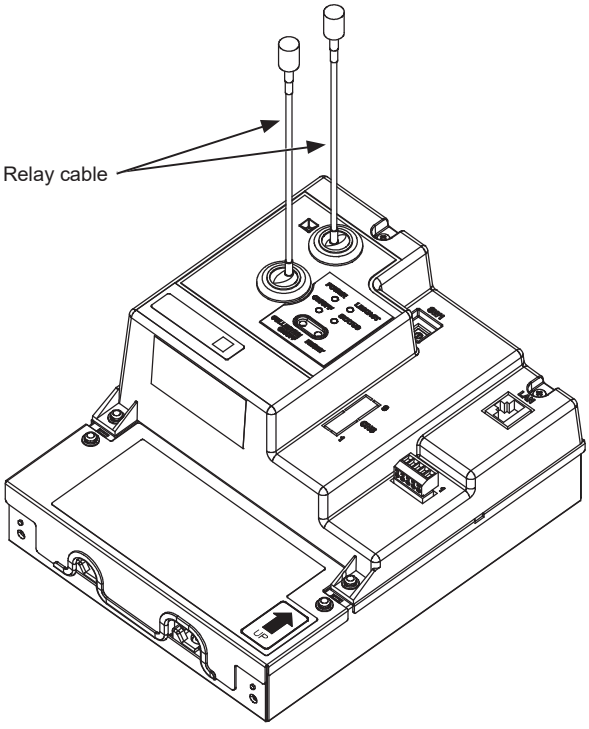
- Before connecting or disconnecting the 3G/4G dongle, turn off the power of the MCC-50.
- Insert the 3G/4G dongle to the USB port gently so as not to damage the USB port.



6. Run the relay cables through the grommets from the backside of the top cover, and attach the top cover.

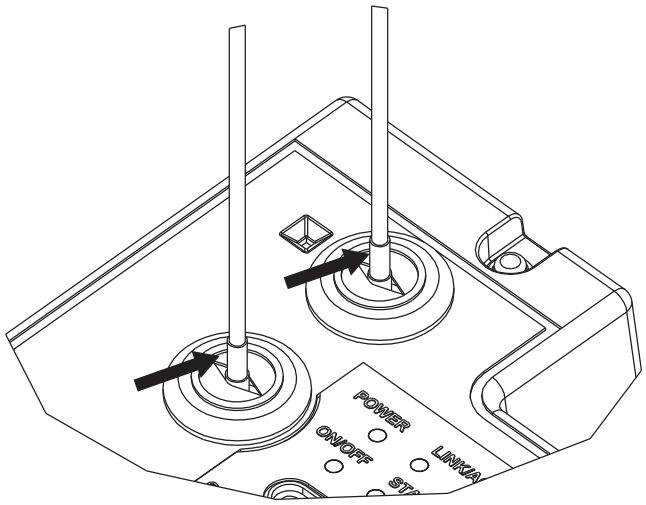
Note

- When running the relay cables through the grommets, use caution not to let the top cover come in contact with the circuit board of the MCC-50.



Note

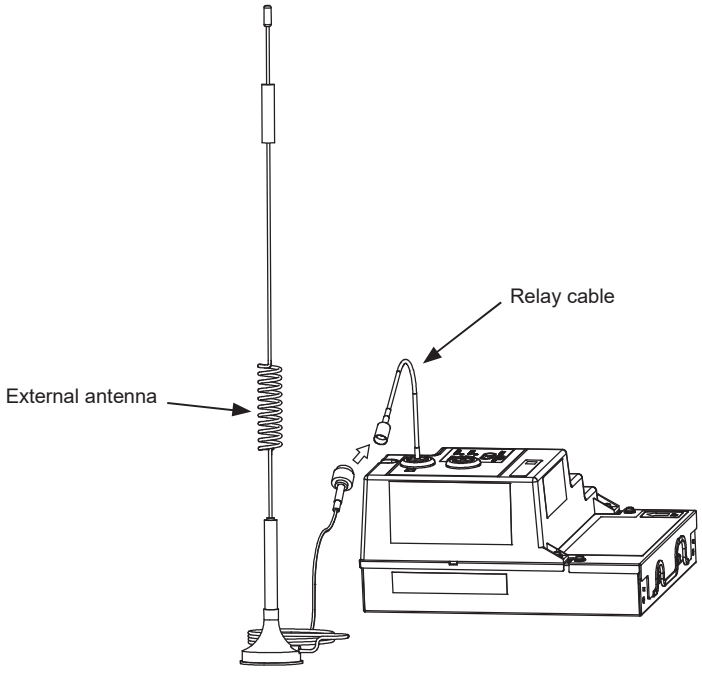
- Pull the relay cables so that the areas indicated by the arrows can be seen.
- Pull the relay cables gently so as not to damage the 3G/4G dongle or the USB port.



7. Connect the relay cables to the external antennas.

Note

- Place the external antennas in a good communication environment. For details, contact the cloud system service provider.



Example of external antenna connection (one external antenna)

7. Initial settings

Make the initial settings by referring to the following procedures before starting a test run.
This chapter describes the items and flow of the initial settings. Note that the setting procedures vary depending on the method to connect to the cloud system.

System 1: Connecting to the cloud system using a mobile phone network (Step 1, Step 3, and Step 4)
System 2: Connecting to the cloud system using a wired network (Step 1, Step 2, Step 3, and Step 4)

Note

- When a LAN cable is connected with a 3G/4G dongle inserted, the mobile phone network takes precedence. Disconnect the 3G/4G dongle to use a wired LAN.

Step	Item	System		Description
		1	2	
1	Registration to the cloud system (Refer to section 7-1.)	V	V	Scan the 2D bar code attached on the MCC-50 using the application specified by the cloud system service provider to register the MCC-50 to the cloud system and set the time zone.
2	Network settings (Refer to section 7-2.)		V	Make the network settings of the MCC-50 (such as IP address and Gateway).
3	Cloud system connection check (Refer to section 7-3.)	V	V	Check that the connection with the cloud system is established. (Check that STATUS (LED) is lit in green.)
4	Registration of air conditioning units (Refer to section 7-4.)	V	V	Set the M-NET address, group, and interlocked operations.

Note

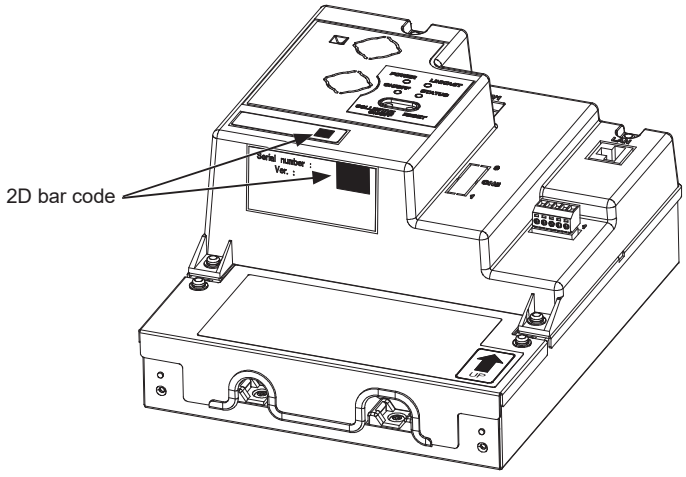
- For detailed information on how to access the service application, register the MCC-50 to the cloud system, set the M-NET address, and register the air conditioning units, refer to the instructions manual issued by the cloud system service provider.

7-1. Registration to the cloud system

Register the serial number of the MCC-50 to the cloud system.
Using the application specified by the cloud system service provider, scan the 2D bar code attached on the MCC-50 to set the time zone and register the MCC-50 to the cloud system.

Note

- Same two 2D bar codes are attached on the MCC-50.
- For information on how to register the MCC-50 to the cloud system, refer to the instructions manual issued by the cloud system service provider.



7-2. Network settings

There are two methods to connect to the network: by using a static IP address and by using a DHCP. Refer to section 7-2-1 when using a static IP address, and refer to section 7-2-2 when using a DHCP.

7-2-1. Using a static IP address

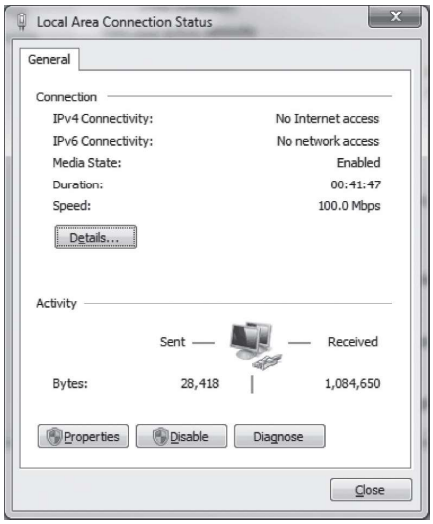
(1) Preparation

To use a static IP address, it is necessary to use the Network Settings window on the web browser.
Set the IP address of the computer by referring to the procedures below. The following table lists the operating systems, browsers, and models of the computers that are supported for using the Network Settings window on the web browser. (This setting is required only when the cloud system is connected via a wired network using a static IP address.)

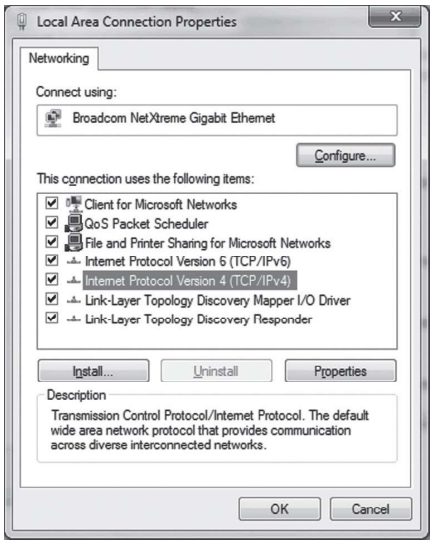
Item	Requirements
CPU	1 GHz or faster (2 GHz or faster recommended)
Memory	2 GB or more
Screen resolution	1024 × 768 or higher
OS	Microsoft® Windows® 10 Mac OS® X10.11
Browser	Microsoft® Internet Explorer® 11 Microsoft® Edge® Ver. 83 Google Chrome™ Ver. 73 Safari® 12

Setting procedures for Windows

(1) Click [Control Panel] on the Start menu, and select [Network and Sharing Center] > [Change adapter settings] > [Local Area Connection]. Click [Properties] in the [Local Area Connection Status] window.
Note: Menu and window titles such as [Local Area Connection] and [Local Area Connection Status] may vary with the OS versions.

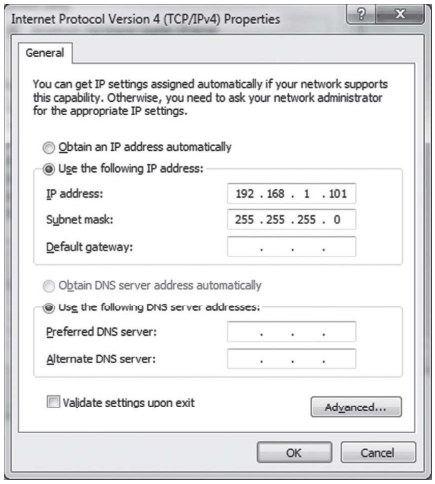


(2) Select [Internet Protocol Version 4 (TCP/IPv4)], and then click [Properties].



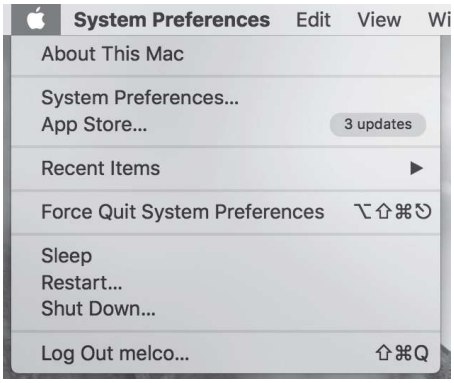
(3) Select [Use the following IP address] in the [Internet Protocol Version 4 (TCP/IPv4) Properties] window.
Enter “192.168.1.*” in the [IP address] field.
(*: Enter a value that is different from the IP address of the MCC-50 to be updated.)
Note: The default IP address of the MCC-50 is [192.168.1.1].

Leave [Subnet Mask] set to [255.255.255.0].
Note: If the settings are made on a computer that is connected to an existing LAN, [255.255.255.0] may not be displayed in the [Subnet mask] field. When [255.255.0.0] is displayed, enter the same number as the IP address of the MCC-50 (192.168) to the first and the second sections of the [IP address] field, and enter the different number from the IP address of the MCC-50 to the third or fourth section of the [IP address] field.



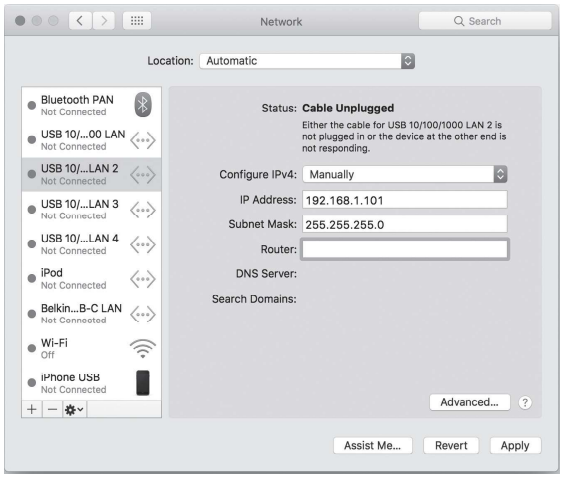
Setting procedures for Mac OS

(1) Click [System Preferences...] on the Apple menu, and then click [Network].



(2) Select the LAN adapter to be set, and enter “192.168.1.*” in the [IP Address] field.
(*: Enter a value that is different from the IP address of the MCC-50 to be updated.)
Note: The default IP address of the MCC-50 is [192.168.1.1].

Leave [Subnet Mask] set to [255.255.255.0].
Note: If the settings are made on a computer that is connected to an existing LAN, [255.255.255.0] may not be displayed in the [Subnet Mask] field. When [255.255.0.0] is displayed, enter the same number as the IP address of the MCC-50 (192.168) to the first and the second sections of the [IP address] field, and enter the different number from the IP address of the MCC-50 to the third or fourth section of the [IP address] field.

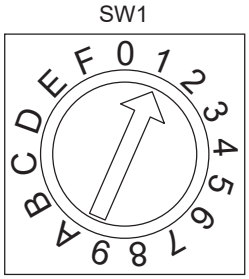


(2) Network settings of the MCC-50

Procedure

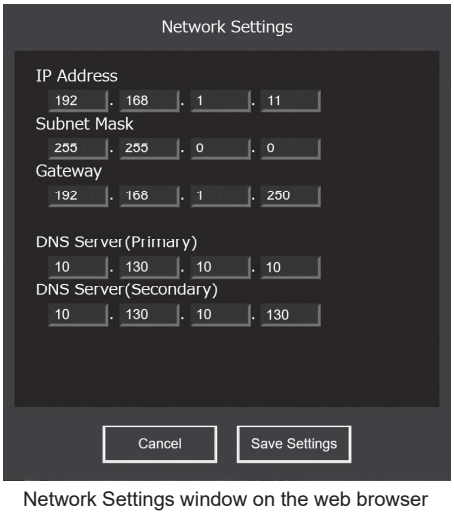
(1) Check that the computer set in (1) “Preparation” is connected to the MCC-50 to be set with a LAN cable.

(2) Set the arrow on the rotary switch SW1 of the MCC-50 to “1,” and turn on the MCC-50.
Note: The arrow should not point at areas between letters.
Note: Set the rotary switch using a precision screwdriver [(-), 2.0 mm (W)] with a torque of less than 19.6 [mN·m] to prevent the rotary switch from being damaged.



(3) Enter the following Website address in the address field of the Web browser, and press the [Enter] key.
http://192.168.1.1/

(4) The Network Settings window shown at right will appear on the web browser.
Set the IP Address, Subnet Mask, Gateway, and DNS Server, and select [Save Settings].
Determine the IP address to be set in consultation with the system administrator.

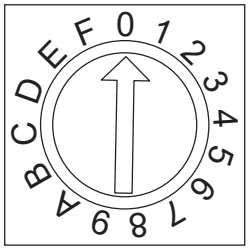


Network Settings window on the web browser

(5) Turn off the MCC-50.

(6) Set the rotary switch SW1 of the MCC-50 to “0,” turn on the MCC-50, and check that the settings have been correctly completed referring to “Procedure for checking the completion of the network settings” below.

SW1



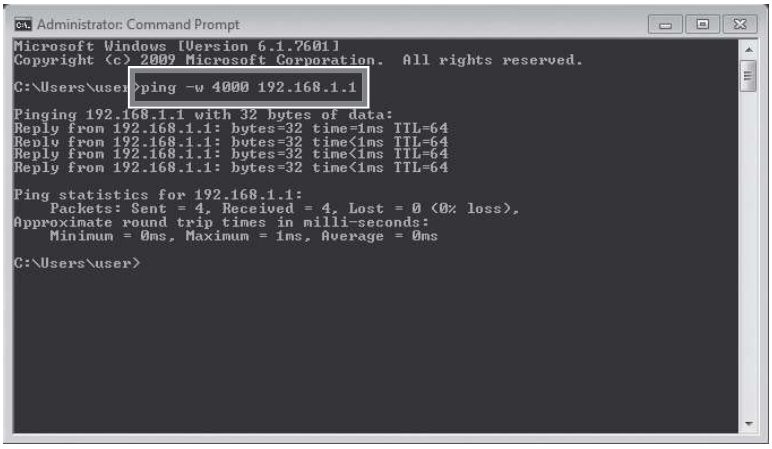
Procedure for checking the completion of the network settings (Windows)

(1) Select [Start] > [Windows System] on the computer used for making the network settings, and start [Command Prompt].

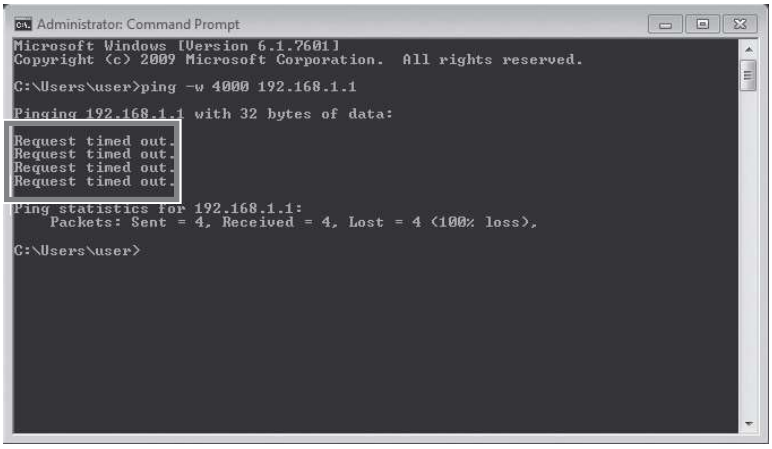
(2) Enter “ping (IP address of the MCC-50),” and press the [Enter] key.

(3) Check that a response is received from the MCC-50 with the specified IP address. (Check that “Request timed out.” does not appear.)

<Ping test result (success): Response is received>



<Ping test result (fail): No response is received>



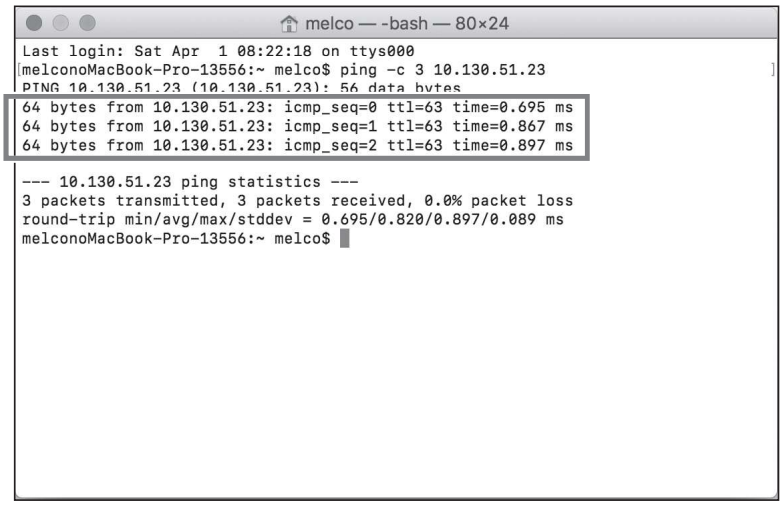
Procedure for checking the completion of the network settings (Mac OS)

(1) Click [Go] > [Utility] > [Terminal] on the toolbar of the computer used for making the network settings.

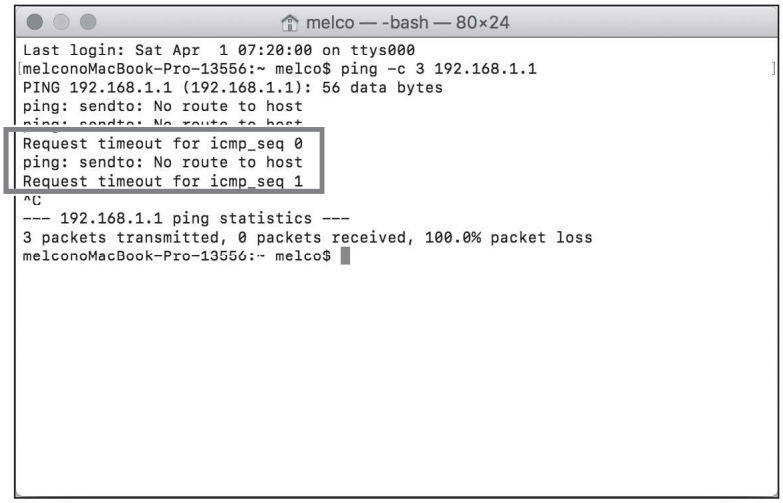
(2) Enter “ping -c 3 (IP address of the MCC-50),” and press the [Enter] key.

(3) Check that a response is received from the MCC-50 with the specified IP address. (Check that “Request timeout for icmp_seq” does not appear.)

<Ping test result (success): Response is received>



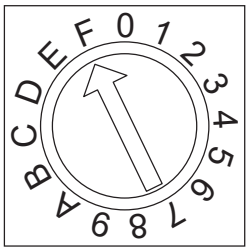
<Ping test result (fail): No response is received>



7-2-2. Using a DHCP

(1) Set the rotary switch SW1 of the MCC-50 to “F,” and turn on the MCC-50.

SW1



(2) Check the connection by referring to 7-3 “Cloud system connection check.”
Note: If the connection fails, check that the router is set to DHCP.

7-3. Cloud system connection check

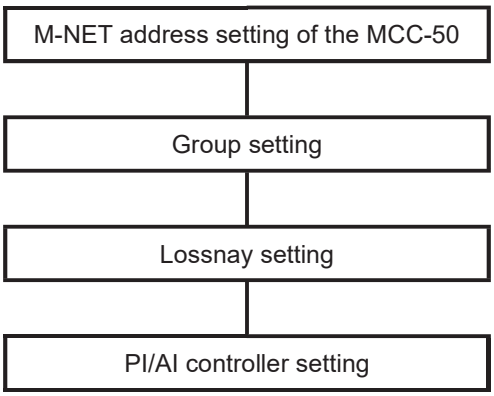
Check that connection between the MCC-50 and the cloud system has been established. Check that the STATUS LED on the MCC-50 is lit in green.

If the STATUS LED blinks in green while a mobile telephone network (3G/4G) is used, the radio-wave conditions are poor. Enhance the radio-wave intensity. For details, contact the cloud system service provider.

7-4. Registration of the M-NET address and air conditioning units

Register the M-NET address and air conditioning units using the system provided by the cloud system service provider. For details on the setting procedures, refer to the instructions manual issued by the cloud system service provider.

The following settings are required to manage the air conditioning units in the cloud.



8. Test run

For the test run procedure, refer to the instructions manual issued by the cloud system service provider.

9. Connection to external devices

9-1. External signal input/output function

⚠ CAUTION

To reduce the risk of injury, do not touch the burrs of the knockout holes.

To use external input/output, a separately-sold external input/output adapter (PAC-YG10HA-E) is required.
When connecting an external input/output adapter (PAC-YG10HA-E), cut out the CN5 knockout hole. (Refer to section 2-1 “Part names” for the location of CN5.)

Note

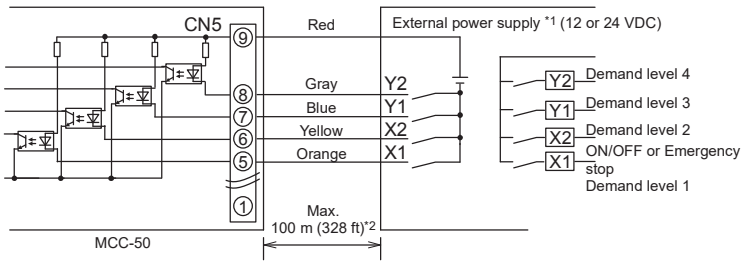
- Connect the external input/output adapter to MCC-50.
- Use caution not to damage the circuit board with tools when cutting out the knockout hole.
- The use of the external input/output function requires certain settings to be made. Refer to the instructions manuals provided by the cloud system service provider.

9-1-1. External signal input function

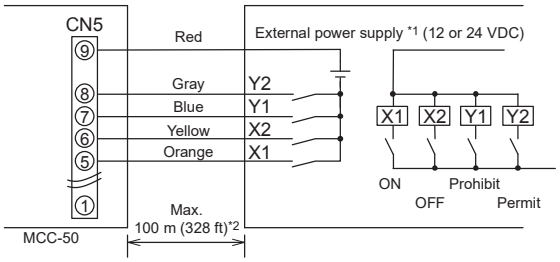
Using external contact signals (12 or 24 VDC), the following collective operations for all connected air conditioning units can be controlled: Demand level, Emergency stop, ON/OFF operation, and Prohibit/Permit local remote controller operation.

(1) Recommended circuit

(A) Level signal



(B) Pulse signal



Use relays X1, X2, Y1, and Y2 that meet the following specifications.

Contact rating
Rated voltage: 12 or 24 VDC
Rated current: 10 mA or above
Minimum applied load: DC 1 mA

*1 Select an external power supply suitable for the relays used. (12 or 24 VDC)
Connect the external power supply in the correct polarity to input and output the signals.
Connect ⑤–⑧ (see the figure at left) to the negative side.

*2 Take sufficient precautions against noise when the cable length is long.

Important

- **Be sure to use an external power supply (12 or 24 VDC) to avoid malfunctions.**
- **Connect the external power supply in the correct polarity to avoid malfunctions.**

Note

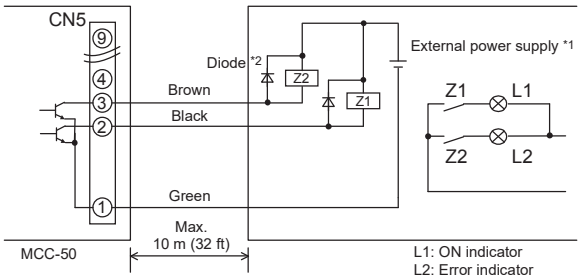
- The relays, DC power supply, and extension cables are not supplied.
- The total length of the lead wire and extension cable should not exceed 100 m (328 ft). (Use an extension cable of 0.3 mm^2 or thicker.)
- Cut the excess cable near the connector, and insulate the end of the unused cable with tape.

9-1-2. External signal output function

An ON signal is output when one or more units are in operation, and an Error signal is output when one or more units are in error. (Operation status (On/Error) of the units that are connected to each MCC-50 will be output.)

(1) Recommended circuit

Relay-driven circuit



Use relays Z1 and Z2 that meet the following specifications.

Operation coil
Rated voltage: 12 or 24 VDC
Power consumption: Max. 0.9 W

*1 Select an external power supply suitable for the relays used. (12 or 24 VDC)
Connect the external power supply in the correct polarity to input and output the signals.
Connect ① (shown in the figure at left) to the negative side.

*2 Use a diode at both ends of the relay coils.

Important

- **Be sure to use an external power supply (12 or 24 VDC) to avoid malfunctions.**
- **Connect the external power supply in the correct polarity to avoid malfunctions.**
- **Do not connect the external power supply without relays being connected to the device (no load).**

Note

- The relays, lamps, DC power supply, diodes, and extension cables are not supplied.
- The total length of the lead wire and extension cable should not exceed 10 m (32 ft). (Use an extension cable of 0.3 mm^2 or thicker.)
- Each element will turn on during operation and when an error occurs.

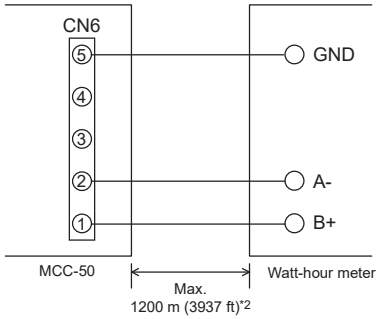
9-2. Connecting to a watt-hour meter

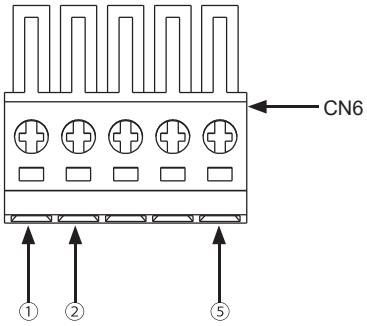
With a compatible watt-hour meter sold separately, the MCC-50 is able to collect electrical energy data. For compatible watt-hour meters, contact the cloud system service provider.

Note

- To connect the MCC-50 to a watt-hour meter, use CN6 (supplied) connected to the MCC-50. (A precision screwdriver for M1 screws is necessary.)

Connect CN6 and the watt-hour meter using a watt-hour meter cable*1 (not supplied) as shown below.





*1 Use a watt-hour meter cable that meets the following specifications.
Type: Twisted pair cable (Max. 1200 m (3937 ft))
- Twisted wire: 0.75 to 1.25 mm², AWG 18 to 16

*2 Take sufficient precautions against noise when the cable length is long.

Note

- The total length of the lead wire and extension cable should not exceed 1200 m (3937 ft).
- Cut the excess cable near the connector, and insulate the end of the unused cable with tape.
- Do not run the signal input cable adjacent to the M-NET transmission and power cables. Do not let the cable form a loop.
- Peel off the sheath to 6 ±1 mm (4/16 ±1/16 in) from the end, and securely insert the cable into the terminal.
- Leave adequate slack in the cables so that the weight of them will not strain the terminal connectors.
- For the usage of the watt-hour meter, see the instructions manual for the watt-hour meter.

10. Maintenance

10-1. Inspection and maintenance

Air conditioning units including MCC-50 may be damaged after long use, resulting in a performance drop or the units becoming a safety hazard. To use them safely and maximize their lives, it is recommended that a maintenance contract with a dealer or qualified personnel be signed. If the contract is signed, service technicians will periodically inspect the units to identify any damage at an early stage, and take appropriate measures.

<Reference> Maintenance/replacement cycle of components

Component	Maintenance/replacement cycle
MCC-50	10 years

* “Maintenance/replacement cycle” is not a warranty period.
* “Maintenance/replacement cycle” indicates the estimated cycle period in which each component should be replaced or repaired.

10-2. Software update

For information on the software update procedure, refer to the instructions manuals provided by the cloud system service provider.

Note: Do not turn off the MCC-50 during software update.

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This product is designed and intended for use in the residential, commercial and light-industrial environment.

The product at hand is based on the following EU regulations (except the 3G/4G dongle and peripheral devices [*1]):

- Low Voltage Directive 2014/35/EU
- Electromagnetic Compatibility Directive 2014/30/EU

*1 Check the 3G/4G dongle and peripheral devices for compliance with the EU regulations.

Please be sure to put the contact address/telephone number on this manual before handing it to the customer.

MITSUBISHI ELECTRIC CORPORATION

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